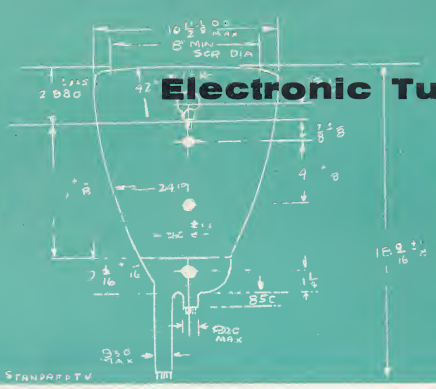
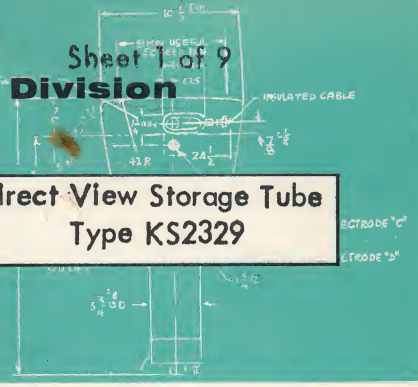
FAIRCHILD
DU MONT LABORATORIES
DIVISIONS OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION
750 BLOOMFIELD AVENUE, CLIFTON, NEW JERSEY

Electronic Tube Division





Direct View Storage Tube Type KS2329

TENTATIVE

The Du Mont Type KS2329 is an eleven (11) inch nominal diameter, flat face Direct View Storage Tube with a useful screen diameter of nine (9) inches. Two glass rodded electron guns are employed: a write gun and a view gun mounted on one ruggedized bracket assembly and placed in an on-axis neck.

The write gun produces a high current, high velocity, electrostatically deflected and focused beam. The modulated beam "writes" information onto the dielectric surface of the storage target, creating a series of electrostatically charged capacitors.

The view gun is a high current, low velocity electron gun which produces a "flood" of electrons. The flow of these electrons to the phosphor screen is controlled by the charges on the storage target. Thus, the "flood" of electrons continuously transfers the stored written information to the screen for viewing. A high accelerating potential between the target and the phosphor screen increases the energy of the "flood" electrons passing through the target, and produces the bright display characteristics of the tube.

The standard phosphor screen (type P20) has a yellow-green fluorescence, high visual brightness, and a short persistence.

The KS2329 is a package containing a Direct View Storage Tube, an integral potted magnetic shield with mounting brackets, and connector cables for all the tube elements.

All voltages with respect to view gun cathode unless otherwise specified.

OPERATING CONDITIONS

	Typical Current	Typical Voltage	Absolute Maximum Ratings
VIEW GUN			
Heater	600 mA	6.3 ± 5%	7.0 Volts
Cathode	1.5 mA	0.0	0.0 Volts
Grid No. 1 Cut-Off		-20 to -60	-200 Volts
Accelerator	500 µA (Note 1)	125	250 Volts

DE-7228
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TENTATIVE

OPERATING CONDITIONS (Continued)

	Typical Current	Typical Voltage	Absolute Maximum Ratings
WRITING GUN			
Heater	600 mA	6.3 ± 5%	7.0 Volts
Cathode	500 µA	-2500	-3000 Volts
Grid No. 1 Cut-Off		-2560 to -2620	-3200 Volts
Accelerator	500 µA (Note 1)	125	250 Volts
Focusing Electrode	0.0 to 1.0 µA	-1600 to -1900	0.0 Volts, 5.0 µA
Deflection Factors		16 to 23	Volts DC per inch/KV of writing gun accelerating voltage
Deflection Plate Current (Impedance of drive to be not more than 100 K ohms)	D1D2 = 50 µA D3D4 = 5 µA		100 µA 20 µA
Deflection Plate Reference		125 ± 10 Volts	125 ± 20 Volts

	Typical Voltage	Typical Current (µA)	Maximum Volts	Minimum Volts
TARGET ASSEMBLY				
Screen	8000	500	10,000	0
Backing Electrode	2 to 13	0	25	0
Collector Electrode Note 1)	200	1500	250	0
Collimating Electrode (E)	10 to 60	5 to 50	100	0
Collimating Electrode (D)	40 to 110	5 to 50	100	0

Direct View Storage Tube
Type KS2329

TENTATIVE

GENERAL CHARACTERISTICS

Test specifications shall be met under the following conditions:

Filament Voltage, view gun and write gun	Ef = 6.3 +0.2 volts
Accelerator Voltage	Ecz = +125 ± 3 volts
Collector Electrode Voltage	Ec = +200 ± 3 volts
Screen Voltage	Ea = +8000 volts
Writing Gun Cathode Voltage	Ek = -2500 ± 100 volts
View Gun Cathode Voltage	Ek2 = 0.0 volts
Backing Electrode Voltage	B.E. = 7 volts, typical
Erase Pulse Amplitude	7 volts, typical

All other voltages shall be within the design specification limits previously mentioned. The Collimator "E", Collimator "D", and flood gun grid bias shall be adjusted to provide a uniform display. Adjust the ambient illumination so that no more than one (1) foot lambert is reflected from the phosphor of the face of the tube.

All light measurements shall be made with a Spectra-Spot Foot Lambert Photometer (Photo Research Corp., Model UB) or equivalent on a 0.5-inch diameter area on the face of the tube.

Write Gun Spot Position		Center of undeflected, focused spot of each gun will fall within a 12-mm radius at the center of the tube face
Cathode Heating Time		60 seconds minimum before applying other voltages
Peak Heater to Cathode Voltage		± 200 volts
Operating Position		Any
Resolution	Note 2)	Minimum of 65 lines per inch
Gray-Scales	Note 3)	Minimum of 4 levels of output brightness
Storage Time	Note 4)	Minimum of 30 seconds
Erase Time	Note 5)	100 milliseconds maximum
Writing Speed	Note 6)	Minimum of 25,000 inches per second

TENTATIVE

GENERAL CHARACTERISTICS (Continued)

Erasing Uniformity	Note 7)	0.4 maximum
Brightness	Note 8)	100 foot lamberts minimum
Angle between Traces, writing gun		90 ± 2 degrees

DISPLAY QUALITY

Viewed Image Quality

Zone A	Four (4)-inch diameter area in center of tube
Zone B	Area extending from Zone A out to a diameter of nine (9) inches
Bright Spots (Note 9)	Any illuminated area of the screen which can be erased with the backing electrode at one volt below viewing beam cut-off
Brilliant Spots (Note 9)	Small areas of the screen that are brighter than maximum brightness of normal screen areas and cannot be erased by normal erasing methods
Dark Spots (Note 9)	Any non-illuminated area of the screen whose brightness is 10% or less of saturated brightness when viewed with the tube flooded to saturated brightness

Blemishes of any kind less than or equal to fifteen thousandths (.015) of an inch shall not be considered spots or defects.

Defect size is to be determined by the defect equivalent diameter which is the width plus the length divided by 2.

Direct View Storage Tube
Type KS2329

TENTATIVE

DISPLAY QUALITY (Continued)

ZONE A				ZONE B			
Number Allowable	Bright Spot Size	Brilliant Spot Size	Dark Spot Size	Number Allowable	Bright Spot Size	Brilliant Spot Size	Dark Spot Size
1	.015 to .040	--------	.015 to .040	4	.015 to .040	.015 to .030	.015 to .040
2	.015 to .030	--------	.015 to .030	8	.015 to .030	----------	.015 to .030
2	.015 to .020	--------	.015 to .020	10	.015 to .020	----------	.015 to .020

No more than five (5) of the above spots to lie within any 1/2-inch diameter circle.

Phosphor Defects — The tube quality will meet or exceed the MIL-E-1D Specifications, pages 135 to 137.

Glass Defects — The tube quality will meet or exceed the JETEC, JG-G5 Specifications, pages 16 to 22.

NOTES

1. This current will rise during writing and by reflection from the backing electrode, when it is cut off.
2. Resolution to be measured by the shrinking raster method at a brightness in the highlights of 150 foot lamberts at a writing speed of 25,000 inches per second.
3. Gray-scale determination to be visual. No less than 4 levels of discernible brightness will be obtained by modulating the writing gun control grid.
4. Storage time to be defined as the time required for background brightness to increase to 10% of maximum light output, after erasure to just visual extinction at the specified ambient light conditions.

TENTATIVE

NOTES
(Continued)

5. Shortest erase time to be defined as the time required to erase a maximum brightness signal to background level.

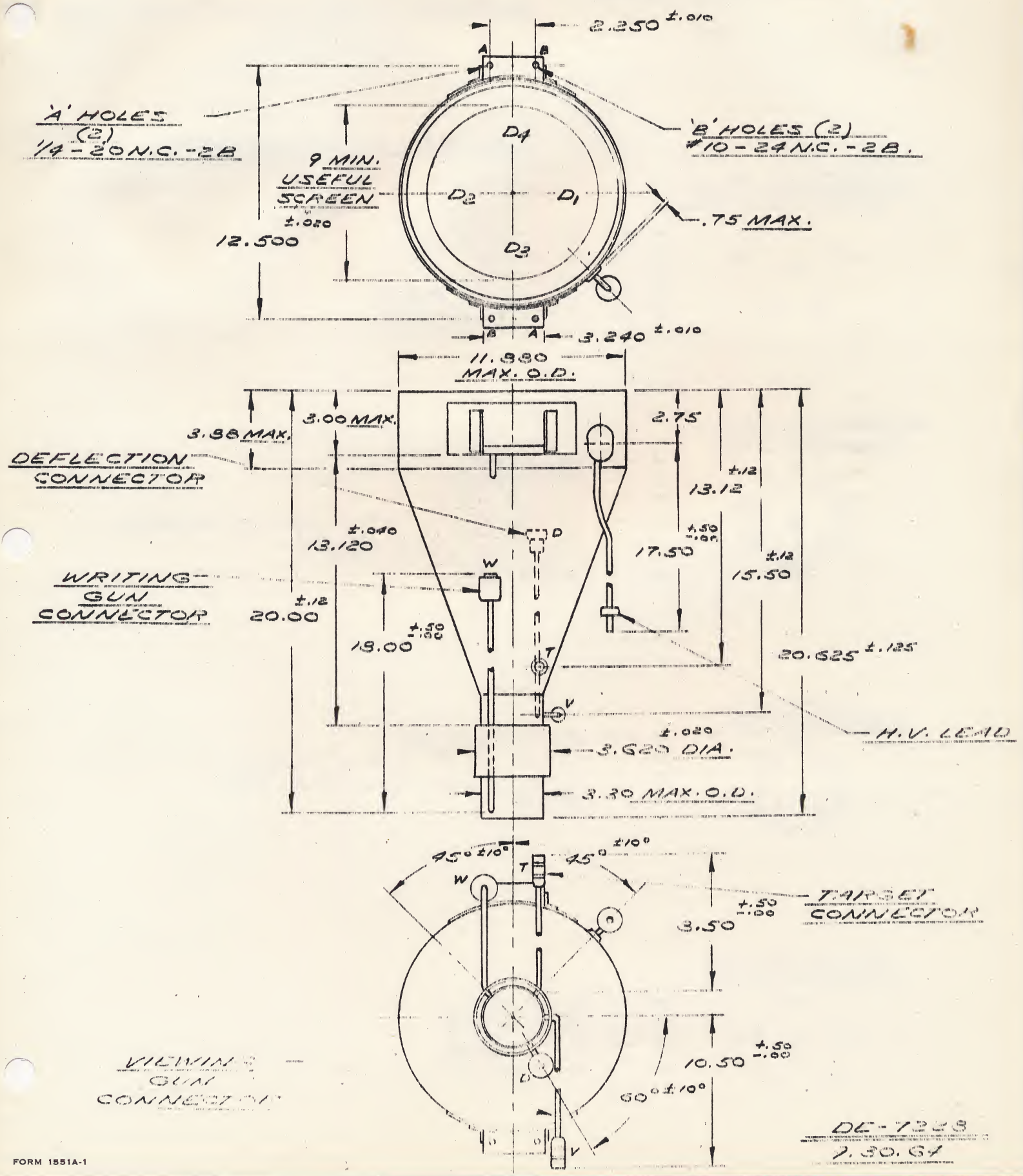
6. Measured with a raster with a written display brightness of 150 foot lamberts in the highlights, with a resolution of 65 lines per inch.

7. With no erasing pulse, overscan the storage surface with the writing beam to obtain maximum pattern brightness. Cut off writing beam. Apply 20 microsecond wide erasing pulses at a variable repetition rate having an amplitude of between five (5) to ten (10) volts and adjust the erase pulse amplitude to cut-off and frequency to obtain complete erasure in approximately 10 seconds. Measure time (t_1) from start of erasing to the instant at which any area within the minimum useful viewing diameter is reduced to background brightness level, and time (t_2) from start of erasing to the instant at which the entire area within the minimum useful viewing diameter area is reduce to background-brightness level. The erasing-uniformity factor is defined as $(t_2 - t_1)/t_2$.

8. To be measured with the entire screen illuminated to equilibrium brightness by overscanning the entire display area with the writing beam until saturated brightness is obtained.

9. These definitions do not apply to phosphor or glass defects.

DIRECT VIEW STORAGE TUBE
K-2339
(TENTATIVE)



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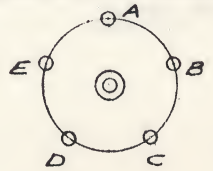
FORM 1551A-1

DIRECT VIEW STORAGE TUBE
K.S 2329
(TENTATIVE)

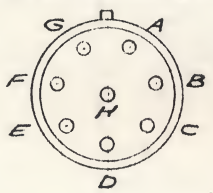
TUBE CONNECTION

WRITING GUN CONNECTOR



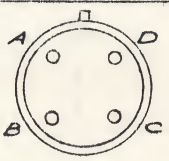
A — CATHODE
B — HEATER
C — HEATER
D — CONTROL GRID
E — FOCUS. ELECT.

VIEWING GUN CONNECTOR



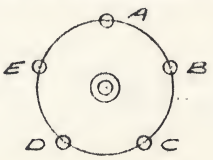
A — HEATER
B — CATHODE
C — GRID NO.1
D — GRID NO.2 (GRID NO.2 & ACCEL. OF WRITING GUN)
F — COLLIMATOR NO.1
G — HEATER

TARGET CONNECTOR



A — BACKPLATE
B — VIEW GUN COLLECTOR
C — VIEW GUN COLLIMATOR NO.2.

DEFLECTION CONNECTOR



B — D.P. NO.1
C — D.P. NO.2
D — D.P. NO.3
E — D.P. NO.4

DE-7228
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DE-7229
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FORM 1551A-1

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DU MONT LABORATORIES

Divisions of FAIRCHILD CAMERA AND INSTRUMENT CORP.

750 BLOOMFIELD AVENUE

CLIFTON, NEW JERSEY 07015, U. S. A.

ATT: ELECTRONIC TUBE SALES DEPARTMENT

FAIRCHILD

DU MONT LABORATORIES

DIVISIONS OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

DU MONT LABORATORIES

Divisions of Fairchild Camera and Instrument Corporation

ELECTRONIC TUBE SALES

DATE

November, 1964

SOURCE OF INQUIRY

KEX Info. Display

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NAME & ADDRESS CORRECT?

Mr. T. Nelson
Systems Consultant
Box 1546
Poughkeepsie, N. Y.

PRODUCT—TYPE

KS2329

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